Risk Assessment and Disaster Management Plan for CRZ Clearance of Construction of Water Supply Pipeline from Vahal to Kalamboli, Navi Mumbai

Prepared for

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Risk Analysis

A hazard is something with the potential to cause harm. This may include health or injury, damage to property, products, production losses or increased liabilities.

A hazardous event occurs when the hazard's potential to cause harm is realized. This might be the rupture of pipeline under pressure, the dropping of an object, the electrocution of a person or the collision of a vehicle.

The term incident has a broader meaning, being used to describe both hazardous events and other unplanned events, or chain of events, which could have caused injury, illness and/or damage to the assets, revenue or environment (so called "near misses").

In order to prevent a hazard being released, counter-measures / preventive controls are required. Preventive controls may be either physical, such as shields, isolation, separation, protective devices, etc. or non-physical, such as procedures, alarm systems, training, drills, etc.

In the case of a corrosion cause, appropriate preventive control would be for example the use of corrosion-resistant coating, the use of a corrosion allowance in design and the implementation of an inspection programme.

Guidewords:

The following guidewords are used to aid in the identification of hazards:

- Pipeline Construction activity
- Electrical hazards
- Environmental hazards
- Confined spaces activity
- Pressure Hazards
- Maintenance

The Hazard Identification and Risk Analysis for proposed activities at construction phase and operation phase has been prepared and presented in below table:

Construction Phase

Hazard category	Hazard	Cause	Consequence	Intended Safeguards
Construction activity	Excavations	Excavation collapse	Personnel Injury	Equipment inspected Excavated soil away from excavation edges (> 1m)
	Civil works (steel cage, concrete foundations)	Human error Improper tools	Personnel Injury Equipment Incidents	Only inspected tools PPE Housekeeping of the area First aid
	Lack of Barrier & Signs	Lack of communications Human error Lack of HSE culture Lack of information concerning hazards Danger area not identified	Accidents Personnel injury	periodical inspections Minimum HSE requirements, including Subcontractors Safe Working Practices
	Noise & vibration	Mechanical equipment	permanent consequences up to chronic diseases	Noise/vibration analysis and level evaluation use of PPE periodical medical check
	Infrastructure	Breakdown of Normal Communications	Possible delay in emergency response Inability to communicate with central body in the event of emergency	

Hazard category	Hazard	Cause	Consequence	Intended Safeguards
Confined spaces activity	Confined spaces		Fatalities Health effects	Atmosphere control Permit to work system PPE (appropriate to the task) Ventilation system (if necessary) Safe working practices
Rotating equipment	Rotating Parts		Accidents/fatalities	check rotating equipment warning signs provide supervision provide work instructions tool box PPE
Hot work	Source of ignition	Hot work during construction Uncertified or defective electrical apparatus	Potential fire & explosion Personnel injury, fatality	PTW Construction HSE plan Certified electrical apparatus Inspection & maintenance Fire fighting facilities. E.g. hoses
Height Hazards	Personnel at height >2 m	Scaffolding	Personal injury/fatality	Use of Anti-sparking tools Certified scaffolders and scaffolding PPEs Risk assessment Mechanical handling procedures Cranes with limit switches

Hazard category	Hazard	Cause	Consequence	Intended Safeguards
Environmental hazards	Weather	High ambient temperature	Heat stress to personnel Personnel injury	Restricted working hours during peak summer for field work Potable water PPE First aid medical facility
Electricity	Voltage > 50 V to 440 V in cables	Electrically powered equipment (temporary and fixed)	Possible fire Personal injury/fatality	Permit to Work Certified electrical equipment Trained and competent personnel Inspection and maintenance of electrical apparatus
Electricity	Electrostatic energy	Static electricity	Personal injury/fatality	Static Electricity Jumpers PPE First aid medical facility Bonding and earthing
Dust & Debris		Poor visibility Dust respiration		Cleaning procedures Use of appropriate PPE

Operation phase

Hazard category	Hazard	Cause	Consequence	Intended Safeguards
Environmental Hazards	Erosion	erosion to the pipeline	Oil spill	Pipeline coating Intelligent pigging activity
	Corrosion	External/Internal corrosion Leaks at welded joints	Oil spill	Pipeline coating Regular Patrolling of pipe line Intelligent pigging activity
Pressure Hazards	Pipeline Burst	High pressure during Hydro testing of piping	Environmental damage Injury to work force Material Loss	Treatment of hydro test water before disposal
Maintenance	Unskilled Manpower	Manual handling of valves/actuators.	Personnel injury and potential equipment damage	Certified & approved contactors First aid
Excavation, Digging	Unauthorised excavation activity	Unauthorised excavation	Oil spill	Signage and boards Authorised excavation activity Hazards shall be communicated to villagers
Pipeline near road crossing	Slip, Trip and Fall			Signage and boards Design as per standards.

Conclusions

The Risk assessment study has been conducted for all the operations involved in the project. The study considers all the hazards associated with all the activities which will be involved. The hazards leading to possible consequences are summarised in the worksheet and the risk mitigation measures and intended safeguards are specifically mentioned in the worksheet. The risk to personnel, process/operation is considered in the study.

It has been found that during construction phase, use of proper PPEs, skilled workers and PTW system will minimize the hazards.